

REMARKS

Applicant will amend the title and drawings as requested by the Examiner upon allowance of the application.

Claims 1, 2, 16-18, and 25 stand rejected under 35 USC 103(a) as being obvious over US Patent No. 5,877,519 to Jewell (hereinafter "Jewell"). Claims 14-15 stand rejected under 35 USC 103(a) as being obvious over Jewell in view of US Patent No. 5,606,572 to Swirhun et al. (hereinafter "Swirhun et al.") Applicant respectfully disagrees with the Examiner's analysis of the claims as detailed below and requests reconsideration of the claims in light of the remarks herein.

More specifically, applicant respectfully submits that Jewell fails to teach or suggest "a semiconductor substrate arranged for emitting light for incidence on an element and responsive to light received from said element" as recited in claim 1.

Firstly, it is submitted that Figure 12 of Jewell, as referenced by the examiner, does not show a light beam 312 and incident light beam 310 permitted by a "semiconductor arrangement". Column 31, line 27 of Jewell states that "if device is a photodetector, incident beam 310 is incident through the top". Column 31, line 29 states "If device is a light emitter, such as an LED, light beam 312 emits preferably out the top". Therefore the light beam 312 and incident beam 310 depicted in figure 12 are misleading, and actually refer to two different embodiments of the invention. In

conclusion the invention displayed in Figure 12, does not disclose “a semiconductor substrate arranged for emitting light for incidence on an element and responsive to light received from said element”. This two-fold limitation provides that, in operation, both of these technical features must occur, not one or the other as in the prior art relied upon.

Secondly, it should be noted that although Jewell discloses the creation of optically emitting or detecting devices operated at different wavelength ranges, the control of the wavelengths of operation cannot be altered once the device has been fabricated, i.e. the wavelength is fixed in operation. Therefore Jewell does not teach or suggest a “resonant cavity.... for emitting light of a first wavelength range” and “layer of absorbing material...that absorbs light of a second wavelength range” as required by claim 1. Thus, claim 1 is clearly patentable over Jewell.

Thirdly, the semiconductor device of claim 1 has separate emission and detection layers which are fundamental to the simultaneous emission and detection modes of the substrate. It is submitted that an active layer 115 of Jewell is not capable of simultaneously emitting and detecting light. It is possible for the active layer to emit or detect light, although this is dependent on the polarity of an external voltage that is applied, hence either the substrate is emitting or receiving, never both. Further to this the single layer of Jewell cannot detect light of a longer wavelength than that emitted, as specified in the previous paragraph.

Finally, it is respectfully submitted that the separate features of the “element... for emitting light” and the “layer of absorbing material” in Claim 1, and the subsequent arrangement of such features also specified in Claim 1, are of fundamental importance to the working of the invention as filed enabling the detection and emission of light to occur using a single substrate. These features are not disclosed in Jewell.

Swirhun et al. does not remedy the shortcomings of Jewell.

For these reasons, Applicant respectfully submits that claim 1 of the subject application is clearly patentable over the cited prior art.

The dependent claims are patentable over the cited prior art for those reasons advanced above with respect to claim 1 from which they depend and for reciting additional features that are neither taught nor suggested by the cited prior art.

In light of all of the above, it is submitted that the claims are in order for allowance, and prompt allowance is earnestly requested. Should any issues remain outstanding, the Examiner is invited to call the undersigned attorney of record so that the case may proceed expeditiously to allowance.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Jay P. Sbrollini". The signature is fluid and cursive, with the first name "Jay" being particularly prominent.

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